Attachment A

List of Water Quality Actions for Stage 1

Increase Delta outflow in the fall

Many of the assets that generate new water for supply purposes or for environmental use can be used for water quality: exceptions are Delta island storage and other actions that could negatively impact water quality, e.g., by increasing organic carbon concentrations at drinking water intakes. To the extent increased outflow improves habitat for fisheries in the fall (attraction flows, decreased salinity in the Delta, etc.) that should be accounted as a benefit for both the ecosystem and water quality. Increased outflow for water quality is not necessarily a competitor with assets for fisheries or water supply when used efficiently.

> ***Example***: Increase minimum required outflow in September through November when outflow is low enough to cause significant seawater intrusion. A 500 cfs increase in Delta outflow for 3 to 4 months (90-120 TAF) could provide significant water quality benefits (lowering chloride concentration by 30-50 mg/L when levels are already elevated). The simplest and most effective method for implementation would be to lower the maximum allowable chloride concentration at Rock Slough (or some other compliance location which could act as a general indicator of seawater intrusion into the South Delta).
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> **Operation rule:** The maximum allowable chloride concentration at Rock Slough could be lowered from 250 mg/L to 225 mg/L. This method would ensure that outflow was only increased when it was actually needed; under some conditions salinity in the Central and South Delta could already be low even though Delta outflow was low due to antecedent conditions.

Operate Delta Cross Channel

This method would utilize discretionary use of the cross channel gates to improve water quality if there was no impact to fish. Although closure of the cross channel will benefit up- and out-migrating salmon under many conditions, closure of the cross channel can under some circumstances negatively impact water quality in the central and south Delta.

> ***Example***: Delta Cross Channel gate operations in October and November could be critical to south Delta water quality if outflow is low and exports are high. CALFED could initiate experiments to determine the effect of gate operations under variable export, outflow, and tidal conditions.
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> **Operation rule:** The default position of the Delta Cross Channel should be open in October and November unless there are very compelling reasons to close the gates for fisheries protection.

Increase export pumping flexibility

This action can be used to improve water quality in two ways: to make other water available for outflow or to selectively withdraw water during high quality periods and decrease it during low quality periods. Exports and diversions can be timed to avoid elevated levels of salinity and/or organic carbon, two of the primary constituents of concern in source water for drinking water suppliers. Significant improvements in Delta water would not be needed 100% of the time if timing of diversions were used to improve the quality of delivered water.

> ***Example***: More flexible pumping capacity could allow lower exports in the fall when salinity is typically the highest (in all but the wettest years) and allow higher exports in the winter or spring months when quality is much better. In the south Delta, organic carbon typically peaks for 3-5 weeks in late February-early March. Avoidance of these elevated levels of organic carbon could reduce the annual export load by about 10%. Environmental Water Account gaming (Spring 1999) showed that there is also a benefit to Delta fisheries in many years when exports are reduced in this period.
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> **Operation rule:** Use the expanded pumping capacity at Banks Pumping Plant and joint point of diversion to export more water under high-quality conditions. The increased capacity could also be used to make up foregone exports later in the water year when exports were reduced under high saline conditions or during the February-March period when organic carbon concentration in the Delta was high. Studies show that yield can be preserved while quality improves under most water years. When used with additional storage, flexible export operations could be coordinated to improve delivered water quality by selectively exporting for storage and/or delivery.

Increase reservoir storage

Additional storage has been shown in recent CALFED studies to significantly improve water quality if operated for this purpose. Additional storage can take the form of increased existing surface storage or development of new groundwater or surface storage.

> ***Example***: Additional north of Delta storage could be used to increase outflow to lower the occurrences and duration of elevated Delta salinity. South of Delta storage could be used in conjunction with a more flexible export/diversion pumping regime to selectively divert high-quality water to newly available storage facilities. Isolation of high-quality supplies in reservoirs for direct delivery to specific users, especially in extended dry periods, may also be an option.
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> **Operation rule:** Dedicate new storage to increase Delta outflow (direct water quality benefit) or to assist selective water quality exports from the Delta (indirect water quality benefit by preserving yield).

Load reduction programs or load management programs

Reduction/management programs addressing TOC loads in the valley and Delta in winter and summer can be a great benefit. Rerouting agricultural drains or holding water (for discharge on outgoing tides in the Delta or for periods of high flows on the San Joaquin River) can provide benefits.

> ***Example*:** CALFED should consider drainage management programs in the Delta that could consolidate, move and/or treat agricultural drainage. Drainage management programs involving drainage from Veale Tract and Byron Tract (RD800) are being actively considered by CALFED. These programs would directly benefit the source water quality of CCWD. Other programs could improve water quality in Clifton Court Forebay and in the source water of the North Bay Aqueduct.

Regional blending

Exchanges of higher quality water among water users (using available supplies) could reduce diversions from the Delta during some periods. Regional blending/water exchanges can also result in improved water quality and net benefits for fisheries.

> ***Example*:** There are exchange possibilities among Bay Area urban water suppliers and between MWD and Friant users. The near-term possibilities depend to some extent on the degree to which relatively minor infrastructure/intertie facilities projects are constructed.

Water purchases

Water purchases can be used to offset water supply losses resulting from fish protection or water quality actions. Depending on where the purchase is made and when, there may be multiple benefits.

> ***Example*:** Purchases for upstream flow enhancement can be used to replace export losses which resulted from actions to improve water quality and/or increase Delta outflow.
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> **Operation rule:** If funding were available, water purchases could be made (structured as an option) to provide the same benefits as additional storage. Options would be initiated in October and called by April. However, the ability to carry out this action may be limited in dry years.

Improved water treatment

Funding for pilot programs and implementation of improved water treatment technologies such as low-pressure membranes and ultraviolet disinfection, if shown to be cost-effective, would further help urban agencies meet existing and future drinking water regulations.

Water quality baseline

A water quality baseline is important for establishing a datum for measuring water quality benefits and impacts. The base condition recommended by CCWD and the other CUWA agencies is the Delta water quality conditions under the 1994 Bay-Delta Accord and upstream AFRP actions. Quantifying the baseline must partially rely on modeling studies because of the limited historical record since the implementation of the flow-related provisions of the Accord (1995-1999 only).

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